What is neuroscience?

Neuroscience is the scientific study of the nervous system and its involvement in mental processes and behavior. Neuroscience is an interdisciplinary field of study that employs the methods, perspectives, and knowledge base of biology, psychology, chemistry, physics, medicine, and other fields to gain a better understanding of how the nervous system functions and controls behavior.

Why major in neuroscience?

Majoring in neuroscience provides interested undergraduate students with the opportunity to explore a fascinating and challenging area of study while preparing for a variety of career options. In addition, many of our life experiences, from the need to wear corrective lenses in childhood to memory loss in old age, are explored as part of the neuroscience curriculum.

What career options exist for neuroscience majors?

Career options for neuroscience majors include biomedical research, health-care, teaching, administration, product development and distribution, government service, pharmaceutical sales, and other areas. Many neuroscience majors pursue graduate study in neuroscience, psychology, neurophysiology, neuropsychology, neuropharmacology, biotechnology, and related areas. Other neuroscience majors enter training programs for medicine, osteopathy, clinical psychology, physician's assistant, nursing, optometry, physical therapy, and healthcare administration. Some individuals with unique skills (such as artistic or writing ability) or interests (legal issues related to neuroscience and psychology) may pursue non-traditional career options such as medical illustration, scientific writing for the general public, law, or public policy. Yet others will enter positions where a strong liberal arts emphasis at the undergraduate level is more important than the specific major and where advanced education and training is not necessary (e.g. direct care provider for children with autism).

The types of career placements include academia (research, teaching, and/or administration in a college or university), health professions (psychology, medicine, osteopathy, physical therapy, etc), corporate institutions (research, administration, and product development or sales), and nonprofit institutions (research, administration, service, federal and state government, government-sponsored programs, public relations, and fund-raising).

What degree is necessary for the different types of careers?

Professor at a college or university: Ph.D. (doctor of philosophy)
Professional services: M.D. (doctor of medicine), D.O. (doctor of osteopathy), O.D. (doctor of optometry), Ph.D.
Research scientist: Ph.D. or professional degree
Research assistant or technician: B.A (Bachelor of Arts), B.S. (Bachelor of Science), M.A. (Master of Arts), or M.S. (Master of Science)
Administrator--Bachelor's degree or above
Other positions—Bachelor’s degree or above

**What are the requirements to graduate with an undergraduate degree in neuroscience?**

Baylor University offers a B.S. degree in neuroscience and students must satisfy the general university requirements for the B.S. degree and the specific requirements for the neuroscience major. The full details are given later in this document, but basically a neuroscience major must complete substantial coursework in science and mathematics, including one course in calculus, two courses in statistics (one calculus-based), three courses in biology, three courses in chemistry, two courses in physics, and nine courses in neuroscience. Most of these courses have a lab component. Thirty-three hours are required in neuroscience and twenty-nine hours are required in math and biology, chemistry, and physics.

**Is the neuroscience major appropriate for those who want to enter the healthcare field?**

The non-neuroscience requirements for a B.S. in neuroscience are virtually identical to those required by the professional schools (medicine, osteopathy, optometry, etc), so the neuroscience major is an excellent choice of undergraduate major. A guide for pre-healthcare neuroscience majors is available from the Neuroscience Advisor.

**What do researchers in neuroscience do?**

As with other fields of scientific research, individual neuroscientists may focus on basic research or applied research, or both. Some neuroscientists focus on basic research leading to a better understanding of the nervous system. Others focus on applied research directed at solving problems (such as Alzheimer’s disease) or evaluating the effectiveness of various treatments and procedures. Many researchers in neuroscience also teach, raise issues of public policy, and/or serve as consultants for government, foundations, and corporations.

**What is the training to be a neuroscientist?**

There are many paths to becoming a neuroscientist. Although many neuroscientists have been specifically trained in neuroscience programs, a significant number of individuals trained in other areas have utilized their training in fields such as medicine, chemistry, engineering, or mathematics to conduct basic or applied research on the nervous system. Thus, neuroscientists vary widely in the type of training they have received. They also differ substantially in the amount of training they have received, ranging from little or no formal training in neuroscience to 5-12 years of formal training. Doctoral programs in neuroscience arose because of the recognition that formal training in neuroscience is very valuable to those seeking to understand the nervous system.

The most prevalent model of training is for students to enter a 4-6 year doctoral program in neuroscience after receiving a bachelor’s degree in one of the sciences (typically biology, psychology, or chemistry). As part of the doctoral program a student will take two years of coursework and complete and defend a major original research project called a dissertation. After earning a Ph.D. in neuroscience (or another closely related field), most individuals pursue 2-3 years of postdoctoral training in a different laboratory usually at a different institution to learn additional neuroscience techniques. Following this long period of training, the well-trained neuroscientist will seek a position in academia, industry, etc.

**Are there research opportunities available for undergraduates?**
Yes, there are a number of opportunities for neuroscience majors to participate in neuroscience research in the department or in summer training programs throughout the country. In general students selected for these opportunities are juniors or seniors who have demonstrated a high level of academic performance and a strong desire to be involved in research.

**What is the neuroscience community like at Baylor University?**

It is comprised of neuroscience faculty, undergraduate students majoring in neuroscience, graduate students majoring in neuroscience, research faculty in the community, and other interested individuals. We have two student organizations in neuroscience (Nu Rho Psi and the Baylor Neuroscience Society) and one in psychology (Psi Chi). Nu Rho Psi is an honor society in neuroscience and Psi Chi is an honor society in psychology. The Baylor Neuroscience Society is open to anyone who is interested in neuroscience, regardless of major. Each of these three groups has its own officers, meetings, and activities, but there is considerable shared interest among the three groups. The three groups have presentations by faculty and students, discussion of research opportunities in neuroscience and psychology, educational programs, social activities, and community service activities.

**I am a premedical student and would like to consider becoming a neuroscience major. Will it take me longer to graduate?**

The BS degree in Neuroscience only requires the university minimum of 124 hours and it is feasible to complete all of the premedical requirements and the requirements for the B. S. degree in Neuroscience with slightly more than 124 hours. You may have some hours with your current major that do not apply to this 124-hour minimum, in which case it might take you longer to graduate.

**What is the difference between the B.S. in Pre-Neuroscience and the B. S. in Neuroscience?**

**Pre-Neuroscience (B.S. Degree)**

All students are admitted as “Pre-NSC majors.” Students will be admitted into the NSC major when they have achieved the following:

Students enrolling at Baylor as freshmen:

A. Completed NSC 1101 and earned a B or better in NSC 1306 and 1106. With permission of the chair or chair’s designate, followed by Dean’s approval, students who fail to earn a B may repeat the course one time. Students who completed another New Student Experiences class may petition to allow that course to substitute for NSC 1101.

B. Completed at least three of the following science education core requirements, with a grade of C or better in all and a minimum GPA in these courses of 2.30: BIO 1305-1105, CHE 1301-1101, PHY 1408 or PHY 1420, MTH 1321.

C. If transfer or AP credit is used to satisfy the above requirements, those grades will not be used in computing science core GPA.

D. Students enrolling at Baylor as freshman must have a minimum overall GPA of 2.75 in no fewer than 45 hours completed at Baylor University. Students will be admitted to the major as soon as they have earned 45 hours and completed the above requirements. Students who have not satisfactorily completed the requirements by the time they have completed 75 hours will not be allowed to continue in the major.
E. Baylor students who change major to Pre-Neuroscience and students enrolling as transfer students are not subject to the 45 hour minimum and do not need to complete NSC 1101 but must have a minimum overall GPA of 2.75. These students will be considered for admission to the Neuroscience major at the end of their second semester as a pre-major, but must meet the above requirements prior to completing 36 hours in the pre-major at Baylor. Only courses taken at Baylor are used in the computation of GPAs.

Exceptions to the above policies based on extenuating circumstances can be directed to the department Chair or Chair’s designee.

Requirements for the B. S. Degree in Neuroscience

Twenty-nine semester hours including the following:
A. NSC 1306-1106, 3319-3119, 3356, and 4330-4130.
B. Two courses (8 hours) from NSC 3311-3111, 3320-3120 and 3323-3123. A third course from this listing may be used to fulfill elective hours in C.
C. Six additional hours from NSC 3311, 3320, 3323, 3370, 4312, (4317 or 4371), 4324, 4V96.
D. A grade of “C” or better is required in all psychology and/or neuroscience courses used for the major.
E. Students are strongly encouraged to enroll in NSC 1101 during their first semester on campus.

Required courses in other fields: A grade of “C” or better is required in each course.
A. BIO 1305-1105, 1306-1106, and 2306.
B. CHE 1301-1101, 1302-1102.
C. MTH 1321 and STA 2381.
D. PHY 1408 and 1409; or 1420 and 1430.
E. PSY 4400.
F. One course from the following:
   PSY 3318
   PSY 3330
   PSY 3350
   PSY 3406
   PSY 4329

NOTE: A student who earns a D or F in a PSY of NSC course may repeat the course. However, University policy prohibits students from taking a course more than three times. A withdrawal (W) counts as an attempt. Keep in mind for repeating courses!

What about the requirement for advanced hours?

Advanced hours (also called upper-level electives) are achieved by taking any course that is at the “3000- 4000” level. The university specifies that you must have at least 36 hours of advanced coursework. All 3000 or 4000 level psychology hours count toward this university requirement. Please note that when you complete the requirements for the psychology major, you will have only taken 19 or 20 hours of advanced credit hours. You must take an additional 16 – 17 hours of advanced courses. To complete the advanced hour requirement, you may take any combination of additional courses inside or outside the department.
What are the additional requirements specified by the University?

1. A minimum of 60 hours must be completed at Baylor University, including your last 30 hours taken in residence.

2. You are required to have a 2.00 GPA overall.

3. You must complete a total of 124 credit hours.

4. You must complete 36 hours of upper level credit hours.

Where do I go for advisement?

1. Freshman pre-majors: University Advisement Office (710-7280). This office is located in the Paul L. Foster Success Center, Sid Richardson, Rm #103. Check BearWeb.

2. Sophomore and Junior pre-majors: College of Arts and Sciences Advising office (CASA). This office is located in Sid Richardson, Rm #053, 710-1524. Check BearWeb.

3. Junior and Senior NSC majors: The neuroscience departmental advisor, Dr. Rachel Clark (Rachel_A_Clarkek@baylor.edu); BSB A.310. (Note: upper-level students who have not satisfied the NSC pre-major requirements are still advised by CASA.)

4. Pre-health students who are majoring in Psychology should pursue additional advisement from the Pre-health advising office located in the Baylor University Science Bldg., Room B.111 (710-3659)

What are the procedures for admittance into a closed class?

The student must register for the course in BearWeb and the system will automatically put them on the electronic waitlist. Once a student is on this list, the system will notify the student by Baylor email if a spot is open for the course. The student has exactly 24 hours from the time the email is sent in which to register for the course. If the student does not register for the course in that exact 24-hour time frame, their name will be dropped from the electronic waiting list and the next person on the list will be notified through their Baylor email. It is important for the student to consistently check their Baylor email daily to see if they have been notified of an opening in a course that they are waitlisted. If they have been notified and missed the 24-hour window, the student must get back on the waitlist.

How do I make sure I have all the courses I need to graduate?

The degree plan is how the university determines your eligibility for graduation. Therefore, you should get a copy of your degree audit every semester to make sure you are meeting all your necessary requirements for graduation. Information about preparing for graduation and filing a graduation card are available through the University’s website.
# Bachelor of Science in Neuroscience

## A Suggested Sequence of Required Courses (2018-2019 Catalog)

### Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Spring</th>
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<tbody>
<tr>
<td>0 Chapel (CHA 1088) / NSC 1101</td>
<td>0 Chapel (CHA 1088)</td>
</tr>
<tr>
<td>3 ENG 1302 (see below)</td>
<td>3 ENG 1304 (see below)</td>
</tr>
<tr>
<td>3 History/Social Science (PSY 1305 recommended)</td>
<td>3-4 Foreign Language 1102/2310 (see reverse)</td>
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<tr>
<td>3-4 Foreign Language 1401/1412 (see reverse)</td>
<td>4 BIO 1306/1106 (see reverse)</td>
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<td>3 ENG 2301 or ENG 2204/2206/GTX</td>
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<tr>
<td>3 Foreign Language 2310 (see reverse)</td>
<td>3 Foreign Language 2120 (see reverse)</td>
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<tr>
<td>1 Lifetime Fitness</td>
<td>4 CHE 1302/1102 (see reverse)</td>
</tr>
<tr>
<td>3 BIO 2306</td>
<td>3 STA 2381</td>
</tr>
<tr>
<td>4 CHE 1301/1101 (see reverse)</td>
<td>3 PSY 3318, 3330, 3350, 3406, or 4329</td>
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<tr>
<td>3 Math (see reverse)</td>
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### Junior Year

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<tbody>
<tr>
<td>3 REL 1310</td>
<td>3 REL 1350</td>
</tr>
<tr>
<td>1 Lifetime Fitness</td>
<td>1 Lifetime Fitness</td>
</tr>
<tr>
<td>4 PHY 1408 or 1420</td>
<td>4 PHY 1409 or 1430</td>
</tr>
<tr>
<td>4 NSC 3311/3111, 3320/3120, or 3323/3123</td>
<td>3 Elective (Variable depending on hours)</td>
</tr>
<tr>
<td>4 NSC 3311/3111, 3320/3120, or 3323/3123</td>
<td>3 Advanced Elective (Variable depending on hours)</td>
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<tr>
<td>3 NSC 3358</td>
<td>3 NSC 3358</td>
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</table>

### Senior Year

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<th>Spring</th>
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<tbody>
<tr>
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<td>3 NSC Elective (see below)</td>
</tr>
<tr>
<td>4 NSC 3319/3319</td>
<td>4 NSC 4330/4130</td>
</tr>
<tr>
<td>4 PSY 4600 (Advanced Statistics)</td>
<td>3 PSC 2302</td>
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<tr>
<td>3 History/Social Science (see reverse)</td>
<td>3 Advanced Elective (Variable depending on hours)</td>
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<tr>
<td>1 Lifetime Fitness</td>
<td>3 Elective (Variable depending on hours)</td>
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</table>

All students must graduate with a minimum of 124 hours, 36 of which must be at the 3000/4000 level.

### Notes about major requirements:

- **Pre-Major:** All students are admitted as a Pre-NSC major. Students are admitted into the NSC major when they have achieved certain requirements. Please see your catalog for those requirements.

- **Important Note:** A student who earns a D or F in a PSY or NSC course may repeat the course. However, a student earning a second D or F in the same, or in a subsequent PSY or NSC course, will not be eligible to continue in the Psychology or Neuroscience major. The student may, however, be eligible to continue studies in another major in the University. Students who believe they have individual circumstances warranting an exception to these grade minimums and failure policies may appeal to the department chair.

- **Neuroscience Electives:** Choose two from NSC 3311, 3320, 3323, 3370, either 4317 or 4312, 4324, or 4V96.

- **Special information regarding elective hours in Neuroscience:** Students planning on graduate study or medical school are strongly encouraged to obtain research experience. Several of the elective courses are research-oriented, but the principal course is 4V96 Special Topics, a variable credit course usually taken for three semester hours of credit twice. Each faculty member has his/her own criteria for admitting students into the course and for awarding academic credit. Most of the faculty require that you agree to work in the laboratory for three semesters—once as a volunteer and then twice for academic credit. As opportunities to work in a given lab are limited, students should make arrangements with a professor at the beginning of the junior year. See the Neuroscience Advisor for details about 4V96 and other elective courses.

- **English requirement:** Freshman Academic Seminars (FAS) may be substituted for ENG 1302. These seminars introduce first year students to the world of academics and the scholarly community through exploration of topics of significant cultural/social importance. Emphasizes critical inquiry and thinking, research, writing, and problem solving. May substitute for a basic requirement on certain degrees only in the College of Arts and Sciences. *Note:* Students majoring in the sciences may take ENG 3300 instead of ENG 1304.

- **A grade of "C" or better is required in all Psychology and/or Neuroscience courses used for the major. A grade of "C" or better is also required for all of the non-Psychology/non-Neuroscience classes included as part of the major requirements. See the audit or undergraduate catalog for a list of these courses.

- **Check your degree audit often through Beanweb to ensure that you are making timely progress toward your degree.**

- For more information, see the undergraduate catalog.

Please see reverse side for important information on general requirements.
Notes about General Requirements:
- Course selection is subject to availability within each semester.
- Please keep in mind that this is only a suggested sequence. Actual sequence will vary according to possible second major, minor, other program of study (including pre-health), and individual circumstances (e.g., transfer credit, dual credit, and credit by exam).
- In order to complete your degree, you must fulfill all requirements in your major and general requirements for the Bachelor of Science.
- To complete a double major, you may not count any courses toward both majors.
- For more specific information on general requirements, see your Undergraduate catalog.
- Check your degree audit often through Bearweb to ensure that you are making timely progress toward your degree.

History/Social Science (choose 2 courses from the following areas - 6 hours):
- Anthropology, Economics, History, Honors, Philosophy, Political Science, Psychology, Sociology, GEOG 300, FAS 1304 or 1305.
- Check your major to determine if special courses are needed.

Foreign Language:
- Option A: One modern language through 2320 level:
  - Arabic, Chinese, French, German, Italian, Japanese, Korean, Portuguese, Russian, Spanish, and Swahili
- Option B: One classical language through 2320 level or two classical through 1302 level:
  - Latin, Greek, Hebrew (If available, Akkadian, Aramaic, Syriac, and/or Ugandic may be used)
  - Chemistry majors must take a modern foreign language; German or Russian are strongly recommended.

Math & Science:
- You must complete a minimum of 34 hours of math and science courses. See the Undergraduate catalog for a more detailed explanation or refer to your audit for specific science/math courses that may be required by your major.
- ALEKS placement exams are used by the Baylor Math Department for placement in MTH 1320 (Pre-Calculus) and MTH 1321 (Calculus I). Please refer to the Math Department website for information and full instructions on the exam process.

Fine Arts: None required for this degree.

Biology/Chemistry Prerequisite Policies:
- Biology: In order to register for BIO 1305 and 1306 students must have either a satisfactory math score on the ACT or SAT OR have completed MTH 1320 (Pre-Calculus) with a grade of B or better OR MTH 1321 with a grade of C or better.
- Chemistry: In order to register for CHE 1301, students must have either a satisfactory math score on the ACT (24) or SAT (550). If you do not meet one of these requirements, you will be asked to complete the ALEKS (Assessment and Learning in Knowledge Spaces) course and earn 85% mastery or higher.